

Remarks

In view of the following remarks and amendments, favorable reconsideration of the outstanding office action is respectfully requested. Claims 1 – 61 remain in this application. Claim 46 has been amended.

1. Telephonic Interview

The Applicant's representative wishes to thank Examiner Taylor for the courtesies extended to him during the telephonic interviews conducted on March 16, 2004 and March 18, 2004. Further, the Applicant also thanks the Examiner for his very thorough review of the specification. During the interviews, the newly applied Meyers reference was discussed. The content of the Applicant's comments are reflected in this response.

2. Specification

The Examiner has indicated various informalities or typographical errors in the specification, which have been corrected as appropriate.

3. Allowed Claims/Subject Matter

Applicant notes with appreciation that the Examiner has indicated the subject matter of claims 4 – 9, 20 – 22, 31 – 33, 39 – 41, 43 – 48 and 51 – 53 are patentable, and would be allowable if rewritten in independent form.

4. § 112 Rejections

The Examiner has rejected claim 46 under 35 U.S.C. § 112, second paragraph, as being indefinite for insufficient antecedent basis. In response, claim 46 has been amended to depend from claim 45, in accordance with the Examiner's suggestion.

5. § 102 Rejections

The Examiner has rejected claims 1, 10 – 18, 23 – 30, 34 – 37, 49, and 54 - 61 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,715,372 to Meyers et al. (hereinafter Meyers). The Applicant respectfully traverses the rejection because the Examiner does not point out where each and every element as set forth in the claim is found in the reference.

Meyers is directed to a method and apparatus for analyzing an input signal. The method selects a set of features that characterize the signal. The selected features are extracted from the input signal. The apparatus includes a neural network that is trained based on the relationship between the feature set and signal characteristics. The extracted features are input to the neural network. Subsequently, the neural network creates an output signal based on the features extracted from the input signal. The output signal of the neural network is used to characterize the input signal.

According to MPEP 2131, “to anticipate a claim, the reference must teach every element of the claim.” A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Claim 1

The Examiner points to col. 4, lines 45 – 65, col. 3, lines 40 – 51, and col. 5, lines 26 – 53 for the proposition that Meyers discloses a “processor being operative to calculate a solution to at least one empirically derived mathematical function by using the at least one measured characteristic as an independent variable in the at least one empirically derived mathematical function, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection,” as recited in claim 1.

The text in col. 3, lines 25 – 60 discusses extracting features from the input signal. Line 40 states that “the feature set is based upon a power spectral measure.” Referring to the text in col. 5, Meyers states that the power spectrum (the power spectral density [PSD] is sometimes called the power spectrum) of the original voice signal is computed for each frequency band. A power spectral distortion for each frequency band is computed by finding the average SNR ratio for each frequency band. Appropriate frequency bands are disclosed in the Table at col. 4, lines 45 – 65. As such, Meyers only performs two basic calculations. One is a signal-to-noise (SNR) ratio, and the other is the computation of a power spectrum.

Those of ordinary skill in the art recognize that the power spectral density is the Fourier transform of a time domain signal. As those skilled in the art recognize, the input signal disclosed by Meyers, can be described either in the *time domain*, i.e., as a function of time t , that is as $h(t)$, or else in the *frequency domain*, i.e., as a function of frequency f , that is as $H(f)$, with $-8 < f < 8$. Thus, $h(t)$ and $H(f)$ are two different representations of the same function. One goes back and forth between these two representations by means of the *Fourier transform* equations. With regard to the signal-to-noise ratio (SNR) calculation, the text at col. 5, lines 25 – 30 teaches that the SNR is calculated by taking the log of the signal power over the noise power for each frame (frequency band). The power values are obtained by the PSD calculation, described above.

As those skilled in the art understand, the term “empirical” pertains to equations or formulae that were based on data analysis. Accordingly, those skilled in the art would not consider taking the Fourier Transform of a time domain input signal to obtain a frequency domain representation of the signal, or taking the log of the ratio of two power values, as being empirically derived mathematical functions. Thus, neither the PSD calculation nor the SNR calculation represents “a solution to at least one empirically derived mathematical function by using the at least one measured characteristic as an independent variable in the at least one empirically derived mathematical function, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection,” as recited in claim 1.

For the above stated reasons, claim 1 is patentable under 35 U.S.C. § 102(b) because the cited art does not include each element recited in claim 1. Claims 10 – 17 are allowable in their own right and also by virtue of their dependency from claim 1. Accordingly, the Applicant respectfully requests that the rejection of claims 1 and 10 – 17 under 35 U.S.C. § 102(b) be withdrawn.

Claim 18 and Claim 49

The Applicant respectfully points out that the Examiner does not provide any analysis for either independent claim 18 or independent claim 49. Claim 18 is directed to a method for evaluating quality in a telephonic voice connection in a telecommunications network.

Claim 49 is directed to a computer readable medium having computer executable instructions for performing a method. The methods recited in claim 18 and claim 49 are similar. The Examiner does not point out where Meyers discloses the step of establishing a telephonic voice connection, as recited in claim 18 and claim 49. Referring to the analysis of claim 1, above, the Examiner also does not show where Meyers discloses the step of “calculating a solution to at least one empirically derived mathematical function by using the at least one measured characteristic as an independent variable in the at least one empirically derived mathematical function, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection,” as recited in claim 18 and claim 49.

For the above stated reasons, claim 18 and claim 49 are patentable under 35 U.S.C. § 102(b) because the cited art does not include each element recited in claim 18 or in claim 49. Dependent claims 23 – 28 are allowable in their own right and also by virtue of their dependency from claim 18. For example, claim 26 recites, among other things, that “the at least one characteristic is selected from the group consisting of C-message noise, magnitude of average power of speech, magnitude of average power of a quiet channel, echo path delay, echo path loss, a speech distortion indicator, and a dropped frame rate in a packet switched network.” Claim 54 recites that “the computer readable medium is selected from the group consisting of a DRAM, ROM, PROM, EEPROM, a hard drive, or compact disk.” The Examiner does not point out where any of this subject matter is disclosed in Meyers. Accordingly, the Applicant respectfully requests that the rejection of claims 18, 23 – 28, 49, and 54 under 35 U.S.C. § 102(b) be withdrawn.

Claim 29

The Examiner also does not provide any analysis for claim 29. Claim 29 is directed to a programmable device for evaluating quality in a telephonic voice connection in a telecommunications network. The Examiner does not point out where Meyers discloses any programmable device. The Examiner also fails to point out where Meyers discloses a “a memory operative to store at least one empirically derived mathematical function having at least one independent variable,” or “an interface control circuit coupled to the memory, the interface control circuit being adapted to receive a revised at least one empirically derived mathematical function from an external device, and store the revised at least one empirically

derived mathematical function in the memory,” as recited in claim 29. The Applicant has already pointed out in the analysis of claim 1 that the Examiner did not show where Meyers discloses a “processor being operative to calculate a solution to the at least one empirically derived mathematical function by using at least one measured characteristic as the independent variable, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection,” an element also recited in claim 29.

For the above stated reasons, claim 29 is patentable under 35 U.S.C. § 102(b) because the Examiner does not point out where the cited art includes each element recited in claim 29. Dependent claims 30 and 34 – 36 are allowable in their own right, and also by virtue of their dependency from claim 29. For example, claim 34 recites, among other things, that “the at least one characteristic is selected from the group consisting of C-message noise, magnitude of average power of speech, magnitude of average power of a quiet channel, echo path delay, echo path loss, a speech distortion indicator, and a dropped frame rate in a packet switched network.” The Examiner also fails to point out where this subject matter is disclosed in Meyers. Accordingly, the Applicant respectfully requests that the rejection of claims 29, 30, and 34 – 36 under 35 U.S.C. § 102(b) be withdrawn.

Claim 37

The Examiner also fails to provide an analysis for independent claim 37. Claim 37 is directed to a method for fabricating a device for evaluating quality in a telephonic voice connection in a telecommunications network. The Examiner’s rejection simply does not address this subject matter. Further, the Examiner fails to show where Meyers discloses the step of “empirically acquiring user perception data by having at least one test subject listen to a plurality of test messages, and rate the quality of each test message in accordance with at least one user perceived impairment characteristic,” as recited in claim 37. The Examiner must show where the cited art discloses each element of the claim in order to make a prima facie of anticipation. On the other hand, the Examiner’s analysis ignores every claims except claim 1.

The Examiner fails to show where Meyers discloses the step of “modeling the user perception data as at least one mathematical function, the at least one mathematical function

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being graphically represented by a two dimensional curve having a shape, the shape of the curve being determined by a set of constants employed in the at least one mathematical function," as recited in claim 37. Again, the limitations in this claim element are simply not addressed by the Examiner. The Examiner fails to show where Meyers discloses the step of "choosing values for the set of constants to thereby fit the two-dimensional curve to the user perception data to thereby generate at least one empirically derived mathematical function," as recited in claim 37.

The Examiner also fails to show where Meyers discloses the step of "converting the at least one empirically derived mathematical function into a set of computer executable instructions," as recited in claim 37. The Examiner fails to show where Meyers discloses the step of "programming the device with the set of computer executable instructions," as recited in claim 37.

Accordingly, claim 37 is patentable under 35 U.S.C. § 102(b) because the cited art does not include each element recited therein. Further, the Applicant respectfully requests that the rejection of claim 37 under 35 U.S.C. § 102(b) be withdrawn.

Claim 61

Finally, the Examiner fails to provide any analysis for independent claim 61. Independent claim 61 is directed to "a programmable device for evaluating quality in a telephonic voice connection in a telecommunications network." The Examiner fails to show where Meyers teaches or discloses this subject matter.

Claim 61 includes "an interface control circuit coupled to the memory, the interface control circuit being adapted to receive revised empirically derived data from an external device, and store the revised empirically derived data in the memory." The Examiner does not point out where Meyers teaches or discloses this element.

Claim 61 also includes a processor programmed to "calculate a revised at least one empirically derived mathematical function using the revised empirically derived data." The Examiner again fails to point out where Meyers includes this subject matter. The Examiner

also fails to show where Meyers discloses a processor programmed to "calculate a solution to the revised at least one empirically derived mathematical function by using at least one measured characteristic as the independent variable, whereby the solution is an estimate of likely user perception of the quality of the telephonic voice connection," as recited in claim 61.

For the above stated reasons, claim 61 is patentable under 35 U.S.C. § 102(b) because the cited art does not include each element recited therein. Further, the Applicant respectfully requests that the rejection of claim 61 under 35 U.S.C. § 102(b) be withdrawn.

6. § 103 Rejections

The Examiner has rejected claims 2 – 3, 19, 38, 42, and 50 under 35 U.S.C. § 103 as being unpatentable for obviousness over Meyers in view of U.S. Patent No. 5,715,372 to Malvar.

As pointed out in previous responses, Malvar discloses a codec that is used to encode and decode digital signals for use in CDs, Internet audio, DVDs, and telephony. During transmission, the system includes an A/D converter that converts an analog audio signal into a digital representation of the audio signal, and a codec, which encodes and compresses the digital signal. The system also includes a decoder and D/A converter that performs the reverse process during reception of an encoded signal. The coder includes a MLT transform processor, a weighting processor, a uniform quantizer, a spectrum processor, and entropy encoder, and a multiplexer (See column 3, lines 21-35). The entropy encoder uses a probability model to measure the amount of information contained in a message and to perform variable-to-fixed length block encoding. The entropy encoder includes a run-length encoder and a Tunstall encoder. The run-length encoder reduces the symbol rate for sequences of zeroes by mapping variable length strings into source code words of a given length using a statistical model. The Tunstall encoder compresses the source code words (See column 15, line 55 to column 18, line 49). The statistical modeling used to perform entropy encoding uses a modified Laplacian-exponential probability density function (PDF) for the run-length encoding (See 18, line 50 - column 19, line 62). The PDF model is controlled by the parameter A (See column 19, lines 38-39). The parameter A is the maximum value of a fixed block (See column 18, lines 23-49).

According to the MPEP 2143, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

A. The prior art references do not teach or suggest all the claim limitations.

Claims 2 – 3 depend from claim 1. The Applicant has pointed out that Meyers does not teach or suggest all the claim limitations of claim 1. The Examiner does not assert that Malvar includes claim elements missing from Meyers. Thus, even if everything the Examiner asserts is true, which it is not, the combination of Meyers and Malvar does not include all of the limitations of claims 2 – 3 by virtue of their dependency from claim 1. However, these claims are patentable in their own right. For example, claim 2 recites that “the at least one empirically derived mathematical function is a cumulative probability distribution function.” Even if Malvar teaches the use of a probability distribution function, the combination of references does not teach or suggest the claimed subject matter because neither reference discloses the use of empirically derived functions to estimate telephonic connection quality. Claim 3, claim 19, and claim 42 recite that the at least one empirically derived function includes three functions, the sum of which add up to one. The Examiner’s rejection does not point out where either reference teaches or suggests this limitation. Claim 38 includes an additional five method steps. The Examiner fails to address any of these additional method steps and fails to show where either reference includes these steps.

B. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

The Examiner asserts that it would have been obvious to one of ordinary skill in the art to modify Meyers to use the PDF taught by Malvar “to further qualify the input signal as taught by Meyers...” The Examiner fails to explain what he means by the phrase using “the PDF to qualify the input signal.” How one skilled in the art would process a time domain input signal by somehow “qualifying” it by a PDF is unknown. The term “qualifying” does not appear to be standard signal processing terminology, and the term is certainly not taught in the references. As such, the Examiner’s statement is vague and would not be understood by one skilled in the art.

As such, the Applicant points out that the PTO may not properly combine prior art references in order to establish *prima facie* obviousness unless there is “some suggestion for doing so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” *In re Jones*, 21 USPQ2d 1941, 1943 – 44 (Fed. Cir. 1992); See also *In re Geiger*, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Thus, obviousness cannot be demonstrated by combining prior art references absent some teaching, suggestion or incentive supporting the combination.

There is no objective teaching in this case, because it is well settled that if a proposed modification renders the prior art invention being modified, unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). In this case, Meyers obtains the power spectrum of the input signal. As noted above, the power spectral density of a signal is obtained by finding the Fourier transform of the random signal, in this case, the input signal. However, one of ordinary skill in the art would not somehow represent an input signal as a PDF before obtaining the Fourier transform, because the resultant transform would not accurately show the spectral component of the input signal.

For the above stated reasons, claims 2 – 3, 19, 38, 42, and 50 are patentable under 35 U.S.C. § 103 because the cited art does not teach or suggest all the claim limitations and because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference

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teachings. Accordingly, the Applicant respectfully requests that the rejection of claims 2 – 3, 19, 38, 42, and 50 under 35 U.S.C. § 103(a) be withdrawn.

7. Conclusion

Based upon the amendments, remarks, and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests reconsideration of the pending claims 1 – 61 and a prompt Notice of Allowance thereon.

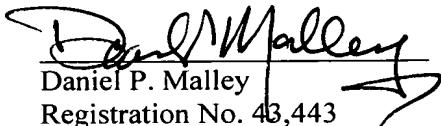
Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Response timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of Worldcom, Inc., 13-2491.

Please direct any questions or comments to Daniel P. Malley at (607) 256-7307.

Respectfully submitted,

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